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Attorney Docket No.: C70237D1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Woodhead, *et al.*

December 18, 2002

Serial No.: 09/800,528

Group Art Unit: 1634

Filed: March 7, 2001

Examiner: D. Gunter

For: BlackCurrant Promoters And Genes

Assistant Commissioner for Patents
Washington, D.C. 20231

AMENDMENT & REMARKS UNDER 37 C.F.R. § 1.111

Sir:

In response to the Office Action dated September 25, 2002 (Paper No. 6), Applicants provide the following amendments and remarks. As this response is timely filed within the shortened statutory period for response of three (3) months, no fee is required. Please charge any additional requisite fees relating to this paper to Deposit Account No. 19-2570.

AMENDMENT

Please amend the claim as follows:

16. A process for isolating a promoter that drives fruit-specific expression of DNA sequences in non-climacteric fruit comprising

- isolating mRNA from ripening blackcurrant fruit;
- preparing a cDNA library from the isolated mRNA;

- c) differentially screening the library from b) to identify genes expressed during the ripening period; and
- d) screening a genomic library with probes prepared from cDNA identified according to step c) to isolate the corresponding gene and its promoter region.

REMARKS

Claim 16 is in this application. Withdrawn Claim 17 is hereby cancelled pursuant to the requirement to restrict mailed April 4, 2002.

The Examiner essentially states that a proper IDS has not been submitted in this application. Applicants respectfully point out that the transmittal letter accompanying the instant application included instructions to "[t]ransfer all references cited by Applicants or by the Examiner from the parent Application Serial No. 09/068,140 filed November 02, 1998. A PTO-1449 listing the references is enclosed." Moreover, the return post card sent with the instant application (and subsequently stamped and returned by the USPTO) indicates that a Form PTO-1449 consisting of two (2) pages was filed with the instant application. Accordingly, Applicants respectfully assert that a list of references in the form of a PTO-1449, and copies of the references themselves, were available to the Examiner in the USPTO at the time the application was filed. In order to advance prosecution of this case, Applicants herewith provide a Form PTO-1449 listing the cited references.

Claim 16 is objected to for certain minor informalities. Applicants thank the Examiner for his careful review of the instant specification and provide herewith an amended Claim 16 correcting these defects.

Claim 16 stands rejected under 35 U.S.C. § 112, second paragraph as indefinite for 1) recitation of the phrase "capable of" in the preamble of the claim and 2) missing the word "in" in the phrase "expression of DNA sequences non-climacteric fruit". Claim 16 has been appropriately amended to address this rejection.

Claim 16 stands rejected under 35 U.S.C. § 103(a) as obvious over Bojorquez in view of Mansson and Yang. Applicants traverse, and respectfully assert that the Examiner has failed to make out a case of *prima facie* obviousness. Bojorquez and Mansson are both biochemical and genetic studies of particular fruit specific enzymes and cDNAs obtained from climacteric plants. Neither reference mentions or even suggests the desirability or value of isolating fruit-specific promoters capable of

driving coordinated gene expression in non-climacteric fruit. In fact, it is clear to one skilled in this art that neither Bojorquez nor Mansson were interested in the promoters from the genes that they studied: both focused on characterization of cDNAs from the climacteric plants that they studied. Both groups performed Southern analysis on genomic DNAs in order to determine the copy number of the gene encoding the isolated cDNAs, or to determine whether these genes were members of larger gene families; again, there is simply no mention of promoters anywhere in either of the cited references. The fact that the cited references provide Southern blotting results on genomic DNA isolated from a climacteric plant provides no motivation to obtain a fruit-specific promoter sequence from a non-climacteric plant.

The Examiner asserts that Mansson demonstrates that the methods described in Bojorquez are adaptable to other fruits. In the first place, Bojorquez describes methods for isolating cDNAs (which by definition do not contain promoter regions) and for performing Southern and northern blot analysis on genomic DNAs using the cDNAs as probes; Bojorquez does not teach or suggest isolation of promoter regions for any purpose. Secondly, Bojorquez and Mansson both study fruit-ripening associated proteins and gene expression in climacteric fruits (i.e., mango and tomato, respectively). Neither mentions nor suggests that the methods can or should be adapted to isolate any DNA from a non-climacteric fruit. Moreover, the methods described by Bojorquez and Mansson are not applicable to the isolation of RNA and DNA from blackcurrant. For example, as described in the instant specification, in order to obtain RNA of a sufficiently high quality, a protocol which varies considerably from that disclosed by Bojorquez had to be developed. Blackcurrants contain a high level of phenolics and polysaccharides and have high acidity, therefore a unique method for extracting high quality of RNA was developed. For example, changes to the physical method of tissue preparation and nucleic acid extraction, as well as changes to certain buffers used during the extraction procedure, were made in order to accommodate the unique properties of blackcurrant. Accordingly, the method of extraction used in the instant invention is not a mere application of known techniques.

Finally, even if one were to give the Examiner the benefit of the doubt and assume that the methods taught in Bojorquez and Mansson could be adapted to non-climacteric fruit, there is no motivation in either reference, either alone or combined,

to apply those methods to obtain fruit specific promoter sequences from blackcurrants that are capable of driving fruit-specific gene expression in non-climacteric plants. As discussed above, there is no teaching of how to obtain such promoters in either of the cited references, nor any motivation to do so for any purpose. In addition, and perhaps most importantly, at the time the instant invention was made, and although the distinction between climacteric and non-climacteric plants was recognized in the art, blackcurrant was not known to be a non-climacteric fruit. Accordingly, there could not have been and in fact is no motivation in the cited art to choose blackcurrant as a source of fruit-specific promoters to drive gene expression in non-climacteric fruit.

Yang is completely irrelevant to any motivation to isolate promoter sequences to drive fruit-specific gene expression in non-climacteric fruit. Yang simply characterizes certain changes in nutritional components in ripening blackcurrant. Contrary to the Examiner's statements, Yang is at best equivocal and may in fact teach away from isolating certain fruit-specific promoters. For example, Yang teaches that the vitamin C content decreases during maturation, accordingly, one skilled in the art might avoid isolation of genetic elements associated with vitamin C accumulation in maturing fruit. Moreover, one skilled in this art appreciates that each of the nutritional characteristics described by Yang are the result of a very complex set of biochemical events. There is simply not motivation nor suggestion to combine Yang with the other cited references to reach the instant invention. Finally, Yang, like Bojorquez and Mansson, also fails to recognize that blackcurrant is a non-climacteric plant.

In summary, the Bojorquez and Mansson references are nothing but studies of biochemical events involved in fruit ripening in climacteric plants. There is no suggestion in any of the cited references to isolate promoter regions for any purpose, or even to study fruit ripening in non-climacteric plant species. And there is simply motivation to combine the cited references for any purpose, and certainly not to obtain promoter sequences from blackcurrant that are capable of driving fruit-specific gene expression in non-climacteric plants. For all of the above reasons, Applicants respectfully request withdrawal of the outstanding obviousness rejection.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The Applicants submit that this application is in condition for allowance and respectfully requests early and favorable

notification to that effect. If it would expedite prosecution of this application, the Examiner is invited to confer with the Applicants' undersigned attorney.

Respectfully submitted,



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